

TENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
 United States Patent and Trademark
 Office
 Box PCT
 Washington, D.C.20231
 ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 29 October 1999 (29.10.99)	
International application No. PCT/EP99/00860	Applicant's or agent's file reference N.73992A SMW
International filing date (day/month/year) 09 February 1999 (09.02.99)	Priority date (day/month/year) 10 February 1998 (10.02.98)
Applicant MEEUWSEN, Petrus, Johannes, Albertus et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
07 September 1999 (07.09.99)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Claudio Borton Telephone No.: (41-22) 338.83.38
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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : C12N 15/55, 9/24, C12P 21/00, C12Q 1/34, A23L 1/0524	A2	(11) International Publication Number: WO 99/41386 (43) International Publication Date: 19 August 1999 (19.08.99)
(21) International Application Number: PCT/EP99/00860 (22) International Filing Date: 9 February 1999 (09.02.99) (30) Priority Data: 98300952.3 10 February 1998 (10.02.98) EP (71) Applicant (for all designated States except US): DSM N.V. [NL/NL]; Het Overloon 1, NL-6411 TE Heerlen (NL). (72) Inventors; and (75) Inventors/Applicants (for US only): MEEUWSEN, Petrus, Johannes, Albertus [NL/NL]; Aagie Dekenstraat 60, NL-6836 RN Arnhem (NL). VAN DER VLUGT-BERGMANS, Cecile, Johanna, Beatrix [NL/NL]; Dahliastraat 13, NL-3911 WB Rhenen (NL). VINCKEN, Jean, Paul [NL/NL]; Willebrordweg 23, NL-6871 ZS Renkum (NL). BELDMAN, Gerit [NL/NL]; Ko van Dijkstraat 32, NL-6708 ML Wageningen (NL). VORAGEN, Alphons, Gerard, Joseph [NL/NL]; Sparrenbos 37, NL-6705 BB Wageningen (NL). HERWEIJER, Margareta, Adriana [NL/NL]; Roelofsstraat 43, NL-2596 VK Den Haag (NL). VAN OOIJEN, Albert, Johannes, Joseph [NL/NL]; Overburgkade 78, NL-2275 XX Voorburg (NL).		(74) Agents: WRIGHT, Simon, Mark et al.; J.A. Kemp & Co., 14 South Square, Gray's Inn, London WC1R 5LX (GB). (81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>Without international search report and to be republished upon receipt of that report.</i>
(54) Title: NOVEL ENDO-XYLOGALACTURONASE (57) Abstract <p>Polypeptides possessing a novel activity, namely endo-xylogalacturonase activity, are disclosed. These polypeptides can degrade pectin found in plant extracts and plant materials, and in particular the "hairy" regions of pectin polymers. In particular, the polypeptides can cleave in a galacturonic acid polymer at internal glycosidic bonds. The novel enzyme XghA is disclosed, and its amino acid sequence and encoding DNA sequence given. This polypeptide was expressed in yeast cells and has been used to treat vegetable material, in particular soy and fruit juice in the preparation of edible foodstuffs.</p>		

FOR THE PURPOSES OF INFORMATION ONLY

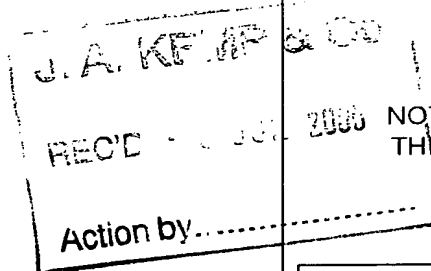
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from the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

WRIGHT, Simon Mark
J.A. KEMP & CO.
14 South Square
Gray's Inn
London WC1R 5LX
GRANDE BRETAGNE



PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing
(day/month/year) 30.05.2000

Applicant's or agent's file reference
N.73992A SMW

IMPORTANT NOTIFICATION

International application No.
PCT/EP99/00860

International filing date (day/month/year)
09/02/1999

Priority date (day/month/year)
10/02/1998

Applicant
DSM N.V. et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/

 European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized officer

Vullo, C

Tel. +49 89 2399-8061



PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference N.73992A SMW	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP99/00860	International filing date (day/month/year) 09/02/1999	Priority date (day/month/year) 10/02/1998
International Patent Classification (IPC) or national classification and IPC C12N15/55		
Applicant DSM N.V. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 07/09/1999	Date of completion of this report 30.05.2000
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Ury, A Telephone No. +49 89 2399 8411 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP99/00860

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-42 as originally filed

Claims, No.:

1-38 as originally filed

Drawings, sheets:

1/8-8/8 as originally filed

2. The amendments have resulted in the cancellation of:

☐ the description, pages:

☐ the claims, Nos.:

☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 35-38.

because:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP99/00860

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):
- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☒ no international search report has been established for the said claims Nos. 35-38.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-27, 29-33
	No:	Claims	34
Inventive step (IS)	Yes:	Claims	1-27, 29-33
	No:	Claims	34
Industrial applicability (IA)	Yes:	Claims	1-34
	No:	Claims	

2. Citations and explanations

see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Item V.

- I) The present invention results from the isolation and characterization of a novel enzyme, an **endo**-xylogalacturonase. An enzyme having **exo**-xylogalacturonase activity has been identified in the prior art (see the present description page 2). However an enzyme possessing an **endo**-xylogalacturonase activity is neither disclosed nor suggested by the available prior art.
Thus, the main subject-matter of the present application fulfils the requirement of Article 33.2 and 3 PCT.
- II) The endo-xylogalacturonase according to the application is present in several microorganisms (description page 3-4), inter alia the fungus of the genus *Aspergillus*. These microorganisms are present in animal feed or foodstuff. Thus, an animal feed or foodstuff comprising a polypeptide which possesses endo-xylogalacturonase activity (see claim 34) lacks novelty under Article 33.2 PCT.
- III) For the assessment of present claim 28 on the question of whether or not it fulfils the requirements of novelty, no unified criteria exist in the PCT. The patentability can also be dependent upon the formulation of the claim. The EPO, for example, does not recognize a product as novel merely by the fact that it is produced by means of a new process.

Item VIII.

- 1) The subject-matter of a great many claims do not fulfil the requirements of Article 6 PCT taken in conjunction with Rule 6.3a PCT which states that the subject-matter for which protection is sought must be defined in terms of the technical features of the invention (i.e in the present case, the sequences).
The claims objected to are claims 1-3 and 7, 12-34 (when they refer directly or indirectly to claims 1-3).
- 2) The expressions:
- "substantially homologous" in claim 4,

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP99/00860

- "fragment (there)of" in claims 4, 8b and 8c,
are vague and indefinite and as such render the scope of the claims unclear. Indeed, these expressions introduce in the scope of the claims, nucleotide or amino acid sequences which may be of very small size and therefore easily objectionable with regard to novelty and/or inventive step. Accordingly, said claims require amendments to remove these defects (Article 6 PCT). Introduction of functional limitations may overcome these objections.
- 3) The expressions "capable of hybridizing" (claims 8b, 8c) and "hybridises selectively" are not acceptable clear technical features per se, since the scope of protection defined by said features varies depending on the conditions used (Article 6 PCT).

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference N. 73992A SMW	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/EP 99/00860	International filing date (day/month/year) 09/02/1999	(Earliest) Priority Date (day/month/year) 10/02/1998
Applicant DSM N.V.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☒ contained in the international application in written form.

☒ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☒ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☒ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☒ Unity of invention is lacking (see Box II).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

To:
J.A. KEMP & CO.
Attn. Wright, Simon Mark
14 South Square
Gray's Inn
London WC1R 5LX
UNITED KINGDOM

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT
OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing
(day/month/year) 24/11/1999

Applicant's or agent's file reference
N.73992A SMW

FOR FURTHER ACTION See paragraphs 1 and 4 below

International application No.
PCT/EP 99/ 00860

International filing date
(day/month/year) 09/02/1999

Applicant

DSM N.V.

1. ☒ The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority



European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Chantal Meyer

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference N. 73992A SMW	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/EP 99/00860	International filing date (day/month/year) 09/02/1999	(Earliest) Priority Date (day/month/year) 10/02/1998
Applicant DSM N.V.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☒ contained in the international application in written form.

☒ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☒ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☒ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☒ Unity of invention is lacking (see Box II).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. _____

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP 99/00860

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-34

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.



The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-34

An endo-xylogalacturonase, nucleic acids encoding it, vectors and hosts containing said nucleic acids and their use.

2. Claims: 35-38

An assay for identifying or detecting a polypeptide having pectin degrading activity and composition for use in this method.

INTERNATIONAL SEARCH REPORT

International Application No

EP 99/00860

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 C12N15/55 C12N9/24 C12P21/00 C12Q1/34 A23L1/0524
A23L1/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C12N A23L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CHEN W P ET AL.: "Purification and some properties of beta-1,3-xylanases from <i>Aspergillus terreus</i> A-07. Endo-1,3-beta-D-xylanase isolation and characterization" AGRICULTURAL AND BIOLOGICAL CHEMISTRY., vol. 50, no. 5, 1986, pages 1183-1194, XP002111869 TOKYO., JP ISSN: 0002-1369 page 1183 -page 1187 --- -/--	1-3



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

18 August 1999

Date of mailing of the international search report

24 NOV. 1999

Name and mailing address of the ISA

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Authorized officer

De Kok, A

INTERNATIONAL SEARCH REPORT

International Application No

EP 99/00860

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	RENARD C.M.G.C. ET AL.: "The xylose-rich pectins from pae hulls" INTERNATIONAL JOURNAL OF BIOLOGICAL MACROMOLECULES, vol. 21, no. 1-2, August 1997 (1997-08), pages 155-162, XP002112536 AMSTERDAM NL abstract page 161, column 2 -page 162 ---	1
A	SCHOLS H A ET AL: "A xylogalacturonan subunit present in the modified hairy regions of apple pectin" CARBOHYDRATE RESEARCH, vol. 279, 27 December 1995 (1995-12-27), page 265-279 XP004018802 amsterdam nl ISSN: 0008-6215 abstract page 277, last paragraph ---	1
A	WO 94 14966 A (GIST BROCADES) 7 July 1994 (1994-07-07) page 1 -page 8 ---	1-3, 20-34
A	EP 0 421 919 A (CIBA GEIGY AG) 10 April 1991 (1991-04-10) page 1 -page 18 ---	1,2,7, 12-17, 19,22-34
A	WO 95 34223 A (NOVONORDISK AS) 21 December 1995 (1995-12-21) page 1, line 1 -page 6, line 16 -----	1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

EP 99/00860

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9414966 A	07-07-1994	BR 9305957 A EP 0628081 A FI 943866 A JP 7503861 T PL 304896 A US 5624834 A US 5830737 A	21-10-1997 14-12-1994 23-08-1994 27-04-1995 09-01-1995 29-04-1997 03-11-1998
EP 0421919 A	10-04-1991	AU 640405 B AU 6205490 A CA 2024487 A DD 297448 A JP 3224489 A MX 22123 A NO 903812 A NZ 235115 A PT 95171 A,B	26-08-1993 07-03-1991 03-03-1991 09-01-1992 03-10-1991 31-01-1994 04-03-1991 25-09-1991 25-06-1991
WO 9534223 A	21-12-1995	AU 2669795 A EP 0765127 A JP 10501412 T ZA 9504924 A	05-01-1996 02-04-1997 10-02-1998 20-02-1996

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference N.73992A SMW	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP99/00860	International filing date (day/month/year) 09/02/1999	Priority date (day/month/year) 10/02/1998
International Patent Classification (IPC) or national classification and IPC. C12N15/55		
Applicant DSM N.V. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 5 sheets, including this cover sheet.

- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 07/09/1999	Date of completion of this report 30.05.2000
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Ury, A Telephone No. +49 89 2399 8411 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP99/00860

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-42 as originally filed

Claims, No.:

1-38 as originally filed

Drawings, sheets:

1/8-8/8 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application.
- ☒ claims Nos. 35-38.

because:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP99/00860

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):
- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☒ no international search report has been established for the said claims Nos. 35-38.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-27, 29-33
	No:	Claims	34
Inventive step (IS)	Yes:	Claims	1-27, 29-33
	No:	Claims	34
Industrial applicability (IA)	Yes:	Claims	1-34
	No:	Claims	

2. Citations and explanations

see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Item V.

- I) The present invention results from the isolation and characterization of a novel enzyme, an **endo**-xylogalacturonase. An enzyme having **exo**-xylogalacturonase activity has been identified in the prior art (see the present description page 2). However an enzyme possessing an **endo**-xylogalacturonase activity is neither disclosed nor suggested by the available prior art.
Thus, the main subject-matter of the present application fulfils the requirement of Article 33.2 and 3 PCT.
- II) The endo-xylogalacturonase according to the application is present in several microorganisms (description page 3-4), inter alia the fungus of the genus *Aspergillus*. These microorganisms are present in animal feed or foodstuff. Thus, an animal feed or foodstuff comprising a polypeptide which possesses endo-xylogalacturonase activity (see claim 34) lacks novelty under Article 33.2 PCT.
- III) For the assessment of present claim 28 on the question of whether or not it fulfils the requirements of novelty, no unified criteria exist in the PCT. The patentability can also be dependent upon the formulation of the claim. The EPO, for example, does not recognize a product as novel merely by the fact that it is produced by means of a new process.

Item VIII.

- 1) The subject-matter of a great many claims do not fulfil the requirements of Article 6 PCT taken in conjunction with Rule 6.3a PCT which states that the subject-matter for which protection is sought must be defined in terms of the technical features of the invention (i.e in the present case, the sequences).
The claims objected to are claims 1-3 and 7, 12-34 (when they refer directly or indirectly to claims 1-3).
- 2) The expressions:
 - "substantially homologous" in claim 4,

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP99/00860

- "fragment (there)of" in claims 4, 8b and 8c,
are vague and indefinite and as such render the scope of the claims unclear.
Indeed, these expressions introduce in the scope of the claims, nucleotide or
amino acid sequences which may be of very small size and therefore easily
objectionable with regard to novelty and/or inventive step. Accordingly, said claims
require amendments to remove these defects (Article 6 PCT). Introduction of
functional limitations may overcome these objections.

- 3) The expressions "capable of hybridizing" (claims 8b, 8c) and "hybridises
selectively" are not acceptable clear technical features per se, since the scope of
protection defined by said features varies depending on the conditions used
(Article 6 PCT).